

## Pegasus Fast Start Guide

DSC Document #7460572 Rev A

**Pegasus** is a rugged, low-power PC/104-*Plus* Single Board Computer (SBC) with a 500MHz AMD LX800 CPU, 256MB of on-board DRAM and an optional 2GB on-board IDE flashdisk.

This Fast Start Guide provides an overview of Pegasus' features, a listing of products, information on the I/O connections and jumpers on-board, BIOS and IDE considerations, and a basic procedure for powering up the SBC. For more detailed information please refer to the Pegasus User Manual.

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### PEGASUS KEY FEATURES

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- ◆ Low power, mid-range PC/104-*Plus* expandable single board computer
- ◆ AMD Geode LX800 processor operating fan-less at 500MHz
- ◆ 256MB DDR DRAM soldered on-board
- ◆ 2GB on-board IDE flashdisk (model PGS800-256-2G only)
- ◆ Fully featured including support for:
  - Four USB 2.0 ports
  - One RS-232 serial port
  - One RS-232/422/485 serial port
  - 10/100Mbps Ethernet
  - IDE hard drive interface for one device
  - Type II CompactFlash socket
  - VGA CRT and 1280 X 1024 LCD
  - PS/2 Keyboard and Mouse
- ◆ Support for Windows XP, Windows XPe, Windows CE, Linux, and DOS
- ◆ PC/104-*Plus* (ISA + PCI) stackthrough expansion
- ◆ -40°C to +85°C operating temperature

### PRODUCT MODEL NUMBERS

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Model	Description
<b>PGS800-256-2G</b>	Pegasus SBC, 500MHz LX800, 256MB on-board DRAM, 2GB on-board IDE flashdisk
<b>PGS800-256</b>	Pegasus SBC, 500MHz LX800, 256MB on-board DRAM, no on-board IDE flashdisk
<b>C-PGS-KIT</b>	Pegasus Cable Kit

## CONNECTOR FUNCTIONS

The board conforms to PC/104 specifications for the four corners and four mounting holes. Wings, or extensions on the left and right sides, provide additional room for I/O connectors. The wings extend 0.25" past the standard PC/104 board edges as shown in the Figure 1 below.

The connector and jumper layout is provided in Figures 1 and 2 below. This layout enables most connectors to be positioned in the board wings and also provides sufficient clearance for the mating connectors when latching connectors are used. All I/O connectors are vertical except for the power I/O, external battery and optional RJ-45.

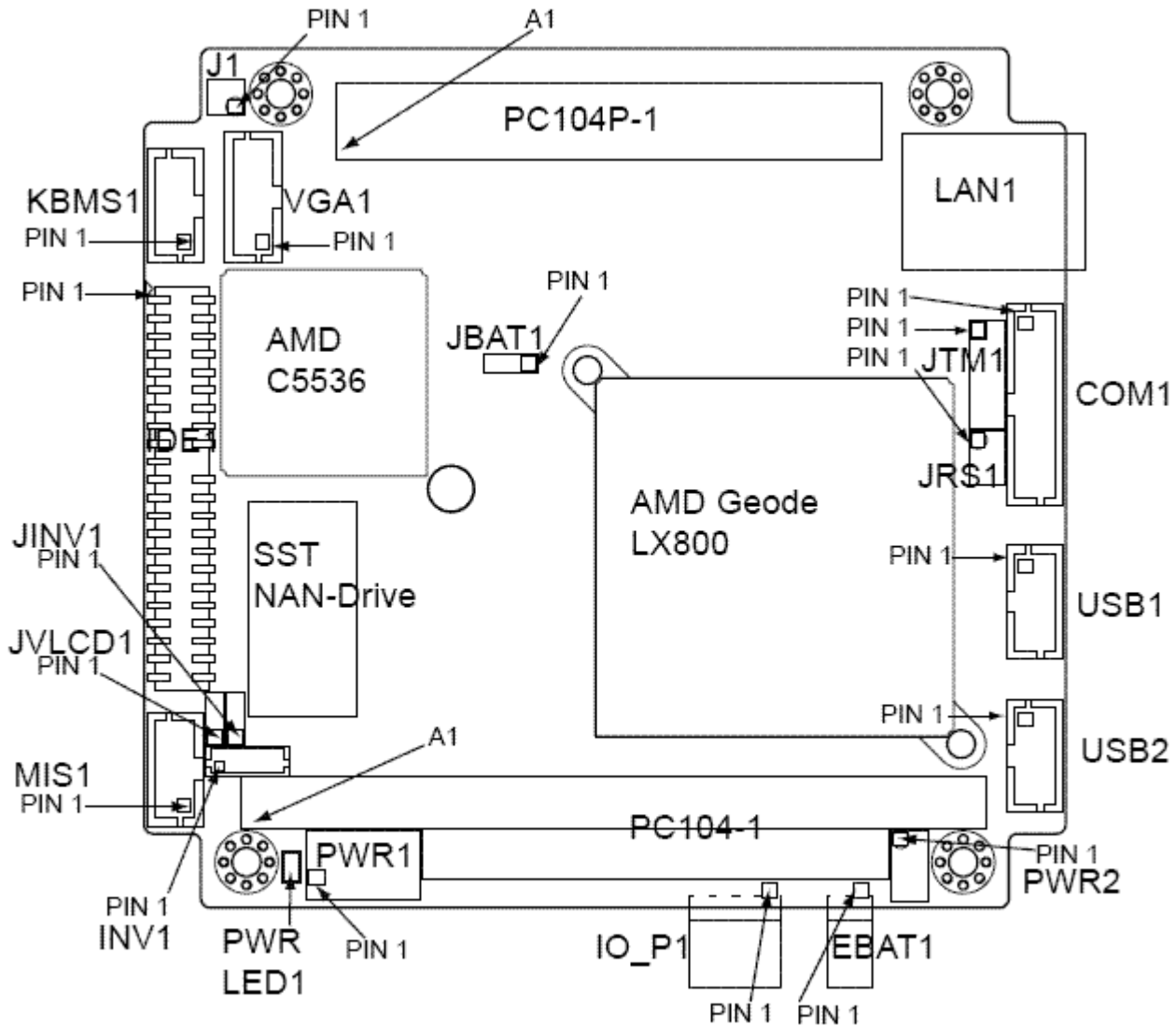


Figure 1. Pegasus top drawing showing connector and jumper locations

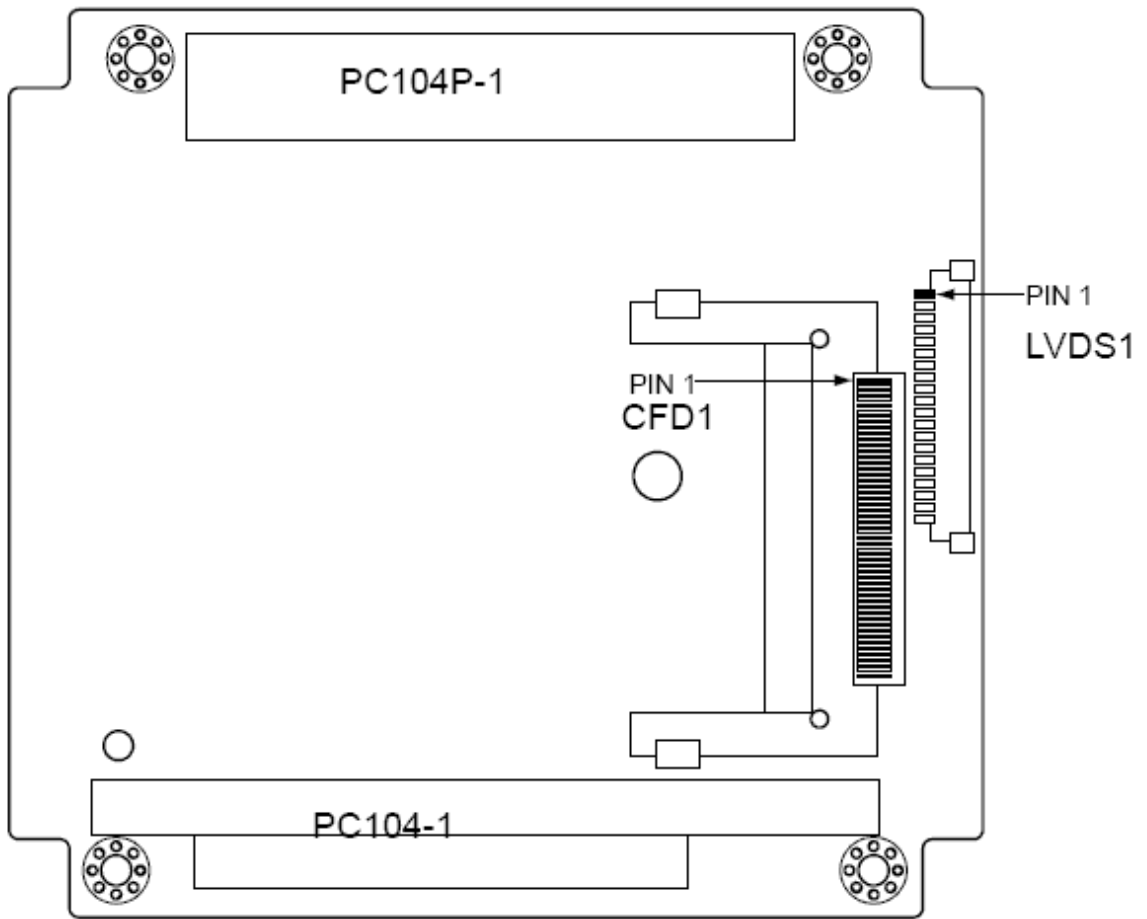


Figure 2. Pegasus bottom drawing showing connector and jumper locations

The following pages describe the pin outs for the Pegasus connectors. Unless otherwise indicated, pins marked as **Key** are cut away or removed from the connector.

### MAIN POWER INPUT CONNECTOR (PWR1)

Input power may be supplied either through this connector, the I/O power connector, or directly through the PC/104 bus power pins.

Ground	1	2	+5VDC
Ground	3	4	+12VDC
Ground	5	6	-12VDC
<b>Key</b>	7	8	+5VDC
Ground	9	10	+5VDC

Pegasus requires only +5VDC input power to operate. However since the PC/104 bus includes pins for +3.3V and  $\pm 12V$ , these voltages may be supplied through this connector if desired. Also if a 3.3V LCD is used, then 3.3V must be supplied through this power connector. Multiple +5V and ground pins are provided for extra current carrying capacity if needed. Each pin is rated at 3A max. For applications requiring less than 3A, the first 4 pins may be connected to a standard 4-pin miniature PC power connector, or the alternate power I/O connector may be used.

### I/O POWER CONNECTOR (IO\_P1)

This connector provides an alternate connector for either input power to the system or output power for use with external drives.

1	+5V I/O
2	Ground
3	Ground
4	+12V I/O

Diamond Systems' cable number **6981006** mates with this connector. It provides a standard full-size power connector for a hard drive or CD-ROM drive and a standard miniature power connector for a floppy drive.

### EXTERNAL BATTERY CONNECTOR (EBAT1)

This connector provides a means to connect an external battery to the Pegasus SBC.

1	Ground
2	+3.3VDC

### ETHERNET CONNECTOR (LAN1)

Pegasus supports both a pin header and an optional RJ-45 jack for Ethernet signals. The pin header pin out is shown here. The RJ-45 pin out matches industry standards. The LED signals are referenced to ground.

TX+	1	2	TX-
NC	3	4	RX-
RX+	5	6	Link LED-
Link LED+	7	8	Act LED+
<b>Key</b>	9	10	Act LED-

### SERIAL PORT CONNECTOR (COM1)

This connector provides access to the 2 serial ports from the CPU chip. Port 1 is RS-232 only and Port 2 may be jumper-configured for RS-232, RS-422 or RS-485 protocols. In RS-422/485 mode, the port may have a jumper-selectable 120-ohm termination resistor across the RX pins and jumper-selectable pull-up/pull-down resistors on the TX/RX lines. The RX resistors are configured so that the port reads back a 0 when it is open circuit.

RS-232 Configuration					RS-422 Configuration					RS-485 configuration								
Port 1	DCD 1	<b>1</b>	<b>2</b>	DSR 1														
	RXD 1	<b>3</b>	<b>4</b>	RTS 1														
	TXD 1	<b>5</b>	<b>6</b>	CTS 1														
	DTR 1	<b>7</b>	<b>8</b>	RI 1														
	Ground	<b>9</b>	<b>10</b>	Ground														
Port 2	DCD 2	<b>11</b>	<b>12</b>	DSR 2	NC	<b>11</b>	<b>12</b>	NC										
	RXD 2	<b>13</b>	<b>14</b>	RTS 2	TX+	<b>13</b>	<b>14</b>	TX-										
	TXD 2	<b>15</b>	<b>16</b>	CTS 2	RX+	<b>15</b>	<b>16</b>	RX-										
	DTR 2	<b>17</b>	<b>18</b>	RI 2	NC	<b>17</b>	<b>18</b>	NC										
	Ground	<b>19</b>	<b>20</b>	Ground	Ground	<b>19</b>	<b>20</b>	Ground										

### USB CONNECTORS (USB1 and USB2)

These connectors provide access to the four USB 2.0 ports. The shield pin is tied to system ground. The key positions are missing to match the key position in the cable to prevent misconnection. Both connectors have the same pin out.

Ground	<b>1</b>	<b>2</b>	+5V
Channel 0 Data+	<b>3</b>	<b>4</b>	Channel 0 Data -
<b>Key</b>	<b>5</b>	<b>6</b>	Ground
Ground	<b>7</b>	<b>8</b>	+5V
Channel 1 Data+	<b>9</b>	<b>10</b>	Channel 1 Data -
Ground	<b>1</b>	<b>2</b>	+5V
Channel 2 Data+	<b>3</b>	<b>4</b>	Channel 2 Data -
<b>Key</b>	<b>5</b>	<b>6</b>	Ground
Ground	<b>7</b>	<b>8</b>	+5V
Channel 3 Data+	<b>9</b>	<b>10</b>	Channel 3 Data -

## PS/2 KEYBOARD / MOUSE CONNECTOR (KBMS1)

This connector provides the standard PS/2 keyboard and mouse signals.

+5V	1	2	+5V
KB Data	3	4	MS Data
KB Clock	5	6	MS Clock
Ground	7	8	<b>Key</b>
NC	9	10	Ground

+5V	Power; connects to pin 4 of the PS/2 connector.
KB Data, MS Data	Data; connects to pin 1 of the PS/2 connector.
KB Clock, MS Clock	Clock; connects to pin 5 of the PS/2 connector.
Ground	Ground; connects to pin 3 of the PS/2 connector.
	<i>Note: Pins 2 and 6 on the Mini-Din-6 PS/2 connectors are unused.</i>
NC	No Connection

## IDE/FLASHDISK CONNECTOR (IDE1)

RESET-	1	2	Ground
D7	3	4	D8
D6	5	6	D9
D5	7	8	D10
D4	9	10	D11
D3	11	12	D12
D2	13	14	D13
D1	15	16	D14
D0	17	18	D15
Ground	19	20	<b>Key</b>
DRQ	21	22	Ground
IDEIOW-	23	24	Ground
IDEIOR-	25	26	Ground
IORDY	27	28	Ground
DACK-	29	30	Ground
IRQ14	31	32	Pulled low for 16-bit operation
A1	33	34	Not Used
A0	35	36	A2
CS0-	37	38	CS1-
LED-	39	40	Ground
+5V	41	42	+5V
Ground	43	44	Not Used

This connector is a 2x22 (44-pin) 2mm-pitch SMT (not through-hole) pin header with gold flash plating. It mates with Diamond Systems' cable number **6981004**, and may be used to connect an external IDE drive (hard disk or CD-ROM). Alternately, an IDE flashdisk module can be plugged into the IDE/Flashdisk connector. Note Pin 20 is removed for keying to prevent incorrect cable installation.

## VGA CONNECTOR (VGA1)

This connector provides the connection for a VGA display.

CRed	1	2	Ground
CGreen	3	4	<b>Key</b>
CGlue	5	6	Ground
CHSync	7	8	DDC Data
CVSync	9	10	DDC Clock

## LCD PANEL CONNECTOR (LVDS1)

This connector is located on the bottom of the Pegasus SBC and provides the connection for a LVDS LCD display.

NC	1
NC	2
Scan Direction	3
Frame Rate Control	4
Ground	5
LVDS Clock+	6
LVDS Clock-	7
Ground	8
LVDS D2+	9
LVDS S2-	10
Ground	11
LVDS D1+	12
LVDS D1-	13
Ground	14
LVDS D0+	15
LVDS D0-	16
Ground	17
Ground	18
VDD SEL	19
VDD SEL	20

## LCD BACKLIGHT CONNECTOR (INV1)

This connector provides connection for the LCD backlight.

1	INV SEL
2	INV SEL
3	Ground
4	Ground
5	DISPEN
6	Brightness

## MISCELLANEOUS SIGNALS CONNECTOR (MIS1)

Ground	1	2	Reset
-HDDLED	3	4	+5V
PLED-	5	6	+5v
-SPKOUT	7	8	+5V
Brightness	9	10	<b>Key</b>

## JUMPER FUNCTIONS

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### COM2 RS-232/422/485 SELECTION (JRS1)

Using jumper JRS1, the COM2 port can be configured to operate in RS-232, RS-422 or RS-485 mode.

Mode	Pins 1-2 Jumper	Pins 3-4 Jumper	Pins 5-6 Jumper
RS-232 (Default)	ON	OFF	OFF
RS-422	OFF	ON	OFF
RS-485	OFF	OFF	ON

### COM2 RS-422/485 FEATURE CONFIGURATION (JTM1)

Using jumper JTM1, the COM2 port RS-422/485 features can be configured. The default configuration is with no jumpers installed.

Feature	Jumper Setting
RS-422/485 TX+ Pull-up	Pins 1 & 2
RS-422/485 TX- Pull-down	Pins 3 & 4
RS-422/485 Terminal 120ohm	Pins 5 & 6
RS-422 Terminal 120ohm	Pins 7 & 8
RS-422 RX+ Pull-up	Pins 9 & 10
RS-422 RX Pull-down	Pins 11 & 12

### CMOS SETUP (JBAT1)

Using jumper JBAT1, the CMOS can be retained or cleared. Immediately after clearing CMOS the default BIOS should be loaded.

Mode	Jumper Setting
Keep CMOS (Default)	Pins 1 & 2
Clear CMOS	Pins 2 & 3

### LCD FEATURE CONFIGURATION (J1)

Using jumper J1, the frame rate and scan direction of the LCD device can be configured.

Feature	Jumper Setting
Frame Rate Low (Default)	Pins 1 & 3 on
Frame Rate High	Pins 1 & 3 off
Scan Direction Low (Default)	Pins 2 & 4 on
Scan Direction High	Pins 2 & 4 off

### LCD BACKLIGHT VOLTAGE SELECT (JINV1)

Using jumper JINV1, the input power voltage for the LCD backlight can be selected.

Voltage	Jumper Setting
+5V (Default)	Pins 1 & 2
+12V	Pins 2 & 3



## LVDS PANEL VOLTAGE SELECT (JVLCD1)

Using jumper JVLCD1, the input power voltage for the LVDS panel can be selected.

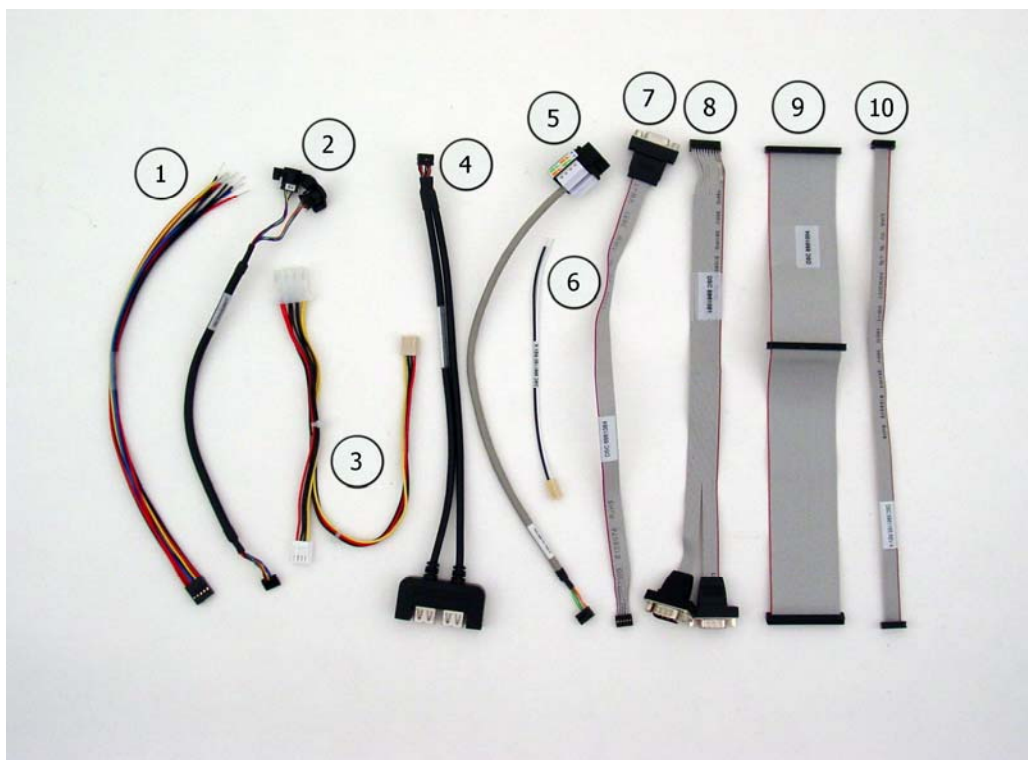
Voltage	Jumper Setting
+5V	Pins 1 & 2
+12V (Default)	Pins 2 & 3

## CABLE NUMBERS

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### Pegasus SBC Cable Kit (C-PGS-KIT)

Photo Number	Item Number	Description
1	6981175	Cable, Crimp 2x5 0.1" Power In
2	6981162	Cable, PS/2 Keyboard/Mouse 2mm 2x5 to 2x Mini-DIN-6
3	6981006	Cable, Power Out
4	6981171	Cable, Crimp 2x5 2mm, Dual USB (Quantity 2)
5	6981161	Cable, Ethernet RJ45PNL-CRIMP2x5 2mm,12"
6	6981180	Cable, External Battery
7	6981084	Cable, VGA, DD15F to IDC12 2mm
8	6981081	Cable, Dual Serial Port 2mm 2x10 to 2x DB9M
9	6981004	Cable, 44-Pos Ribbon IDE Drive
10	6981165	Cable, IDC10FxIDC10F, 2mm, 12"



## POWERING ON PEGASUS

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Follow these steps to power on and verify the functionality of the Pegasus SBC. This process assumes you have a Pegasus SBC and cable kit.

1. Connect a VGA monitor to the SBC. Attach the VGA cable, 6981084, to the VGA connector on the SBC and connect your monitor VGA cable to the DB9 socket.
2. Connect a keyboard and mouse to the SBC. Attach the PS/2 Keyboard/Mouse cable, 6981162, to the PS/2 connector on the SBC and connect your keyboard and mouse devices to the connectors on the other end of the cable.
3. (Optional for USB Keyboard/Mouse) If you are using a USB keyboard and mouse, attach the USB cable, 6981171, to the USB0-1 connector on the SBC and connect your keyboard and mouse devices to the connectors on the other end of the cable.
4. Connect an external IDE hard drive or CD device to the SBC. Attach the IDE ribbon cable, 6981004, to the IDE/Flashdisk connector on the SBC and connect your IDE device to the connector on the other end of the cable. Note: you must provide an external source of power for your IDE device.
5. (Optional for USB storage device) If you are using a USB storage device, attach the USB cable, 6981171, to the USB0-1 (USB2-3 if using a USB keyboard and mouse) connector on the SBC and connect your external storage device to the USB0 (USB2 if using a USB keyboard and mouse) connector on the other end of the cable.
6. Connect the SBC to power. Attach the Power In cable, 6981175, to the Power In connector on the SBC. Ensure your +5V power source is off. Connect your +5V power source to the other end of the cable.
7. Turn on the power source.

The Pegasus BIOS screen should appear and then the SBC should begin booting from the external storage device.

## BIOS CONFIGURATION FOR ADD-ON BOARDS

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When you plug PC/104 boards onto Pegasus, the BIOS may or may not recognize the new board. If the new board is not recognized, you may need to configure the new hardware in the BIOS before being able to use it. You can configure the system's IRQ/DMA resources from the BIOS's PnP/PCI Configurations screen. Following is a table of the IRQs for the system peripheral devices.

IRQ Level	Function
IRQ 01	PC/AT Enhanced PS/2 Keyboard
IRQ 03	Communications Port
IRQ 04	Communications Port
IRQ 05	Standard Enhanced PCI to USB Host Controller
IRQ 05	Standard Open HCD USB Host Controller
IRQ 06	Standard Floppy Disk Controller
IRQ 10	Advanced Micro Devices Win 2K/Win Graphics Driver
IRQ 10	Geode LX AES Crypto Driver
IRQ 11	Realtek RTL8139/810x Family Fast Ethernet NIC
IRQ 12	Microsoft PS/2 Mouse
IRQ 14	Primary IDE Channel

## BIOS CONFIGURATION FOR THE ISA BUS I/O ADDRESSES

The default configuration for the ISA bus is as follows. Together these two connectors comprise connector PC104PI.

IOCHCHK-	<b>A1</b>	<b>B1</b>	Ground	Ground	<b>C0</b>	<b>D0</b>	Ground
SD7	<b>A2</b>	<b>B2</b>	RESETDRV	SBHE-	<b>C1</b>	<b>D1</b>	MEMCS16-
SD6	<b>A3</b>	<b>B3</b>	+5V	LA23	<b>C2</b>	<b>D2</b>	IOCS16-
SD5	<b>A4</b>	<b>B4</b>	IRQ9	LA22	<b>C3</b>	<b>D3</b>	IRQ10
SD4	<b>A5</b>	<b>B5</b>	-5V	LA21	<b>C4</b>	<b>D4</b>	IRQ11
SD3	<b>A6</b>	<b>B6</b>	DRQ2	LA20	<b>C5</b>	<b>D5</b>	IRQ12
SD2	<b>A7</b>	<b>B7</b>	-12V	LA19	<b>C6</b>	<b>D6</b>	IRQ13
SD1	<b>A8</b>	<b>B8</b>	ENDXFR-	LA18	<b>C7</b>	<b>D7</b>	IRQ14
SD0	<b>A9</b>	<b>B9</b>	+12V	LA17	<b>C8</b>	<b>D8</b>	DACK0-
IOCHRDY	<b>A10</b>	<b>B10</b>	Key	MEMR-	<b>C9</b>	<b>D9</b>	DRQ0
AEN	<b>A11</b>	<b>B11</b>	SMEMW-	MEMW-	<b>C10</b>	<b>D10</b>	DACK5-
SA19	<b>A12</b>	<b>B12</b>	SMEMR-	SD8	<b>C11</b>	<b>D11</b>	DRQ5
SA18	<b>A13</b>	<b>B13</b>	IOW-	SD9	<b>C12</b>	<b>D12</b>	DACK6-
SA17	<b>A14</b>	<b>B14</b>	IOR-	SD10	<b>C13</b>	<b>D13</b>	DRQ6
SA16	<b>A15</b>	<b>B15</b>	DACK3-	SD11	<b>C14</b>	<b>D14</b>	DACK7-
SA15	<b>A16</b>	<b>B16</b>	DRQ3	SD12	<b>C15</b>	<b>D15</b>	DRQ7
SA14	<b>A17</b>	<b>B17</b>	DACK1-	SD13	<b>C16</b>	<b>D16</b>	+5V
SA13	<b>A18</b>	<b>B18</b>	DRQ1	SD14	<b>C17</b>	<b>D17</b>	MASTER-
SA12	<b>A19</b>	<b>B19</b>	REFRESH-	SD15	<b>C18</b>	<b>D18</b>	Ground
SA11	<b>A20</b>	<b>B20</b>	SYSCLK	Key	<b>C19</b>	<b>D19</b>	Ground
SA10	<b>A21</b>	<b>B21</b>	IRQ7				
SA9	<b>A22</b>	<b>B22</b>	IRQ6				
SA8	<b>A23</b>	<b>B23</b>	IRQ5				
SA7	<b>A24</b>	<b>B24</b>	IRQ4				
SA6	<b>A25</b>	<b>B25</b>	IRQ3				
SA5	<b>A26</b>	<b>B26</b>	DACK2-				
SA4	<b>A27</b>	<b>B27</b>	TC				
SA3	<b>A28</b>	<b>B28</b>	BALE				
SA2	<b>A29</b>	<b>B29</b>	+5V				
SA1	<b>A30</b>	<b>B30</b>	OSC				
SA0	<b>A31</b>	<b>B31</b>	Ground				
Ground	<b>A32</b>	<b>B32</b>	Ground				

The ISA bus I/O address ranges can be changed in the BIOS.

## CONFIGURING IDE DEVICES

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The on-board PCI IDE connector supports two IDE devices: a primary master and a primary slave. The supported IDE devices include the on-board flashdisk, a CompactFlash disk, a flashdisk plug in module on the IDE connector, or external IDE devices. You can configure the system's IDE devices from the BIOS's Standard CMOS Features screen. Many devices have on-board jumpers for configuring itself as a master or slave. Consult the device's User Manual for details.

The possible IDE device combinations for the two Pegasus models are as follows:

### Model: PGS800-256-2G

Master	Slave
Device on IDE Connector	2GB on-board flashdisk
CompactFlash Disk	2GB on-board flashdisk

The 2GB on-board flashdisk on Pegasus model PGS800-256-2G is fixed as the primary slave device and defaults to drive C: if no other bootable device is found. If a bootable device is found as the primary master, the on-board flashdisk is assigned drive D:. This model does not allow for devices on the IDE connector and a CompactFlash disk to co-exist.

### Model: PGS800-256

Master	Slave
Device on IDE Connector	Device on IDE Connector
CompactFlash Disk	Device on IDE Connector